

The pattern of atopic dermatitis in a group of patients attending two private clinics in Erbil city

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Abstract

Background and objective: Atopic dermatitis is a chronic, relapsing inflammatory disease of the skin. It is a common disease that primarily affects young children. It results from complex interactions between genetic susceptibility genes. This study aimed to assess atopic dermatitis among the affected cases, mainly in terms of age and gender distribution, and its clinical and laboratory findings.

Methods: A descriptive cross sectional study was carried out in two private clinics in Erbil city. A convenience sampling method was used to recruit 70 study participants who were clinically examined by the investigator. A questionnaire was specially designed for interviewing these patients. The diagnosis was made on the clinical ground. Patients were also sent for blood investigations and a skin swab for microscopic examination.

Results: The mean \pm SD of the participants' age was 20.57 ± 17.94 years. Females constituted 68.6% of the participants. More than 64% of the patients had generalized body lesions, 54.3% had a positive family history of atopic dermatitis, and 48.5% had a history of other atopic diseases. The majority (58.3%) of those aging less than two years had face lesions while the majority (74.4%) of the patients aging more than 15 years had generalized body lesions, and this was statistically significant.

Conclusion: Atopic dermatitis affects a wide age group, and different age categories have different sites of the lesion. Family history is a prominent feature of the disease. Clinically, lichenification is more among older age groups compared to the eczematous lesion, which is more among younger age groups.

Keywords: Atopic dermatitis; Assessment; Erbil city.

Introduction

Atopic dermatitis (AD) is a chronic, relapsing inflammatory disease of the skin. It is a common disease that primarily affects young children. The inherited tendency of the human body to produce immunoglobulin E (IgE) antibodies as a response to some common proteins from the environment like pollen, house dust mites, and some food allergens is called Atopy.¹ AD is considered to be a severe inflammatory and pruritic dermatological disease which is a result of complex interactions between genetic susceptibility genes resulting in a defective skin barrier, defects in the innate immune

system, and increased immunologic responses to allergens and microbial antigens.² The downregulation of cornified envelope genes (filaggrin and loricrin), reduced ceramide levels, increased levels of endogenous proteolytic enzymes, and enhanced transepidermal water loss result in a marked decrease in skin barrier function which associated with AD.³ Around one-fifth of all people are affected by AD during their lifetime. The prevalence of the disease greatly varies throughout the world.⁴ Globally, it is estimated that the prevalence of AD is 15-20% and 1-3% among children and adults, respectively. It is also estimated that the incidence of the

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disease has increased twice or trice during the last few decades, especially in industrialized countries.⁵ The main findings of AD may include xerosis, lichenification, and eczematous lesions. Depending on the patient's age, different locations of the patient's body show eczematous changes of different morphology. AD is clinically presented with pruritis and eczema, which are the essential features of the disease. The typical morphological and age-specific patterns may affect the face, neck, extensor areas in children, flexural areas in any age group, excluding axillary and groin regions. Other important features which support the diagnosis of AD could be the early age of onset, personal or family history of Atopy, and xerosis.⁶ The diagnosis of AD is mainly made clinically, and it depends on the historical features of the disease. The morphological features, skin lesions' distribution, and the associated clinical signs also play a crucial role in the diagnosis.⁷ Elevated levels of immunoglobulin E (IgE) and circulating eosinophils are also some associated laboratory abnormalities of the AD, but the diagnosis is mainly based on personal/family history of atopy and physical examination by excluding other conditions.⁸ Atopic dermatitis is a common skin inflammatory disease that poses a significant burden on patients' quality of life. To improve the general knowledge about such disease, this study aimed at assessing atopic dermatitis among the affected cases, mainly in terms of its age and gender distribution, and its clinical and laboratory findings.

Methods

This descriptive cross sectional study was carried out in two private clinics in Erbil city, the capital of Iraqi Kurdistan, from August to December 2017. A convenience sampling method was used to recruit 70 study participants who were clinically examined by the investigator. A questionnaire was specially designed for interviewing these patients, which included questions on some

socio-demographic criteria of the studied sample like age, sex, and occupation, besides some other relevant questions like the first onset of the disease and sites of the lesions. The data on family history of related diseases like atopic dermatitis, asthma, rhinoconjunctivitis, and food allergy were also collected. The diagnosis was made on the clinical ground, and all patients were sent to undergo some blood investigations like Leptin hormone, lipid profile, and IgE level. In addition, a swab was taken from the skin lesion for microscopic examination. Microsoft Excel 2010 and the statistical package for the social sciences (version 20) were used for data summarization and data analysis. The Chi-square test was used to identify any association between different variables in the study. A *P* value of ≤ 0.05 was considered to be statistically significant. Ethical approval was obtained from the Research Ethics Committee of the College of Medicine, Hawler Medical University. Verbally informed consents were obtained from the participants who were assured about the anonymity of the study.

Results

Of the 70 patients who participated in this study, 27.1% were between 16-25 years old, 21.4% were between 26-35 years, and 17.2% were between 2-5 years. The mean \pm SD of the participants' age was 20.57 ± 17.94 years, with a minimum age of four months and a maximum of 73 years. Females constituted 68.6% of the participants, and the majority of participants (91.4%) were of urban residence, as shown in Table 1. Concerning the sites of the lesions, 64.3% of the participants had generalized body lesions, 17.1% had trunk lesions, 11.4% had face lesions, and 7.1% had extremities involvement. The age of onset of the disease in more than one fifth of the sample was 7-20 years and also less than one year of age, followed by 1-2 years of age (12%). The mean \pm SD of the participants' age of onset of the disease

was 8.30 ± 10.05 years. The majority (38.6%) of the participants were of normal

weight, followed by obese (32.8%), and overweight (18.6%), as shown in Table 2.

Table 1: The socio-demographic characteristics of the studied sample.

Variable	Frequency	Percentage
Age in years		
< 2	8	(11.4)
2-5	12	(17.2)
6-15	10	(14.3)
16-25	19	(27.1)
26-35	15	(21.4)
≥ 36	6	(8.6)
Gender		
Male	22	(31.4)
Female	48	(68.6)
Address		
Urban	64	(91.4)
Rural	6	(8.6)

Table 2: The lesion sites, age of onset of the disease and weight status of the studied sample.

Characteristic	Frequency	Percent
Site of the lesion		
Face	8	(11.4)
Trunk	12	(17.1)
Extremities	5	(7.1)
Generalized	45	(64.3)
Age of first onset		
<1	22	(31.4)
1-2	12	(17.1)
3-6	6	(8.6)
7-20	22	(31.4)
>20	8	(11.4)
Body mass index		
Underweight	7	(10)
Normal weight	27	(38.6)
Overweight	13	(18.6)
Obese	23	(32.8)
Total	70	(100)

The majority (98.6%) of the studied sample had pruritis, followed by xerosis (95.7%), lichenification (70%), eczematous lesions (58.6%), and associated bacterial and viral infection (31.4% and 8.6%) respectively. Almost half of the participants had a history

of other atopic diseases (67.6% had allergic rhinitis, 11.8% had asthma, and 20.6% had both). Also, 54.3% of the sample had a family history of atopic dermatitis, as shown in Table 3.

Table 3: Associated features, history of other atopic diseases and family history of atopic dermatitis

Associated factor	Frequency	Percent
Pruritis		
No	1	(1.4)
Yes	69	(98.6)
Lichenification		
No	21	(30)
Yes	49	(70)
Xerosis		
No	3	(4.3)
Yes	67	(95.7)
Eczematous lesion		
No	29	(41.4)
Yes	41	(58.6)
Associated viral infection		
No	64	(91.4)
Yes	6	(8.6)
Associated bacterial infection		
No	48	(68.6)
Yes	22	(31.4)
History of atopic diseases		
No	36	(51.4)
Yes	34	(48.5)
If Yes, what disease?		
Asthma	4	(11.8)
Allergic rhinitis	23	(67.6)
Both	7	(20.6)
Family history of atopic dermatitis		
No	32	(45.7)
Yes	38	(54.3)

Concerning hormonal and other biochemical investigations, 60% of the studied sample had a high level of Leptin hormone, 64.3% had a high IgE level. Excluding those who were under two

years old for whom we had no lipid profile, 10% of the sample had a high cholesterol level, 8.6%, 2.8%, and 1.4% had a high triglyceride, HDL and LDL level, respectively as shown in Table 4.

Table 4: Hormonal and other biochemical markers assessment of the studied sample.

Marker	Frequency	Percent
Leptin hormone		
Normal	28	(40)
High	42	(60)
IgE		
Normal	25	(35.7)
High	45	(64.3)
Triglyceride		
Normal	44	(62.9)
High	6	(8.6)
Missing*	20	(28.6)
Cholesterol		
Normal	43	(61.4)
High	7	(10)
Missing*	20	(28.6)
HDL		
Normal	48	(68.6)
High	2	(2.8)
Missing*	20	(28.6)
LDL		
Normal	49	(70)
High	1	(1.4)
Missing*	20	(28.6)

* Investigations were not done for these cases because of their young age (less than 2 years)

The participants were further divided into three age groups; <2 years, 2-12, and ≥13 years. The association between these three different age categories and a number of other variables was studied. The study revealed a significant association between participants' age and their lesion's site, with 58.3% of less than two years group had face lesion, 74.4%, and 53.3% of those aging ≥13 and 2-12 years, respectively had generalized lesions. A significant association was also found with lichenification, as 81.4% of those aging ≥13 years had lichenification and

33.3% of those aging <2 years. A significant association was also found with the existing of eczematous lesion since 91.7% of those aging <2 years had such a lesion compared to 73.3 % and 44.2% for those aging 2-12 years and ≥13 years, respectively. No significant association was found with xerosis, as shown in Table 5. The study also revealed a significant statistical association between Leptin and IgE levels. More than 75% of those patients having a high level of Leptin had elevated IgE level too, 24.4% had normal IgE level, as shown in Table 6.

Table 5: Association between the age of participants and site of the lesion, presence of lichenification, xerosis, and eczematous lesion.

Lesion characteristics	Age in years			P value
	< 2 years No (%)	2-15 years No (%)	> 15 years No (%)	
Site of the lesion				
Face	7 (58.3)	1 (6.7)	0 (0)	<0.001
Trunk	0 (0)	2 (13.3)	10 (23.31)	
Extremities	0 (0)	4 (26.7)	1 (2.3)	
Generalized	5 (41.7)	8 (53.3)	32 (74.4)	
Lichenification				
No	8 (66.7)	5 (33.3)	8 (18.6)	0.005
Yes	4 (33.3)	10 (66.7)	35 (81.4)	
Xerosis				
No	1 (8.3)	0 (0)	2 (4.7)	0.559
Yes	11 (91.7)	15 (100)	41 (95.3)	
Eczematous Lesion				
No	1 (8.3)	4 (26.7)	24 (55.8)	0.005
Yes	11 (91.7)	11 (73.3)	19 (44.2)	
Total	12 (100)	15 (100)	43 (100)	

Table 6: Association between Leptin hormone and IgE levels.

Leptin level	IgE level		Total No (%)	P value
	Normal No (%)	High No (%)		
Normal	15 (53.6)	13 (46.4)	28 (100)	0.013
High	10 (24.4)	32 (75.6)	42 (100)	

Discussion

Atopic dermatitis is a chronic eczematous dermatitis characterized by having diverse clinical features and a high prevalence. Many different hypotheses were suggested about its pathogenesis, but its cause remained not fully understood. Understanding of its clinical features may help in clarifying the pathogenesis of the disease.⁹ The study revealed that the mean \pm SD of the participants' age was 20.57 \pm 17.94 years. Patients aging 16-25 years constituted 27.1% of the sample followed by 21.4% for those aged 26-35 years, 17.2% for those aged 2-5 years, 14.3% for those aged 6-15 years, and 11.4% were less than two years old. These results were to some extent consistent with those of a study conducted in Seoul, Korea which revealed that the majority (37.7%) were between 19-30 years old, followed by 11-18 years (24%), 3-10 years (20.8%) and less than two years (4.1%).⁹ A study conducted in Japan revealed that 38.7% of the participants were between 20-29 years followed by 0-9 years (23.4%), 10-19 years (21.8%) and 30 years and older (16.1%).¹⁰ Regarding the age of onset, 31.4% of the patients had the disease when they were less than one year old, and a similar proportion was reported for those aging 7-20 years, followed by 1-2 years (17.1%), 20 years and older (11.4%), and 3-6 years (8.6%). While the Korean study revealed that 30% of the participants had an age of onset of 7-18 years, followed by more than 18 years (22.9%), 3-6 years (19.1%), less than one year (15%) and 1-2 years (13%).⁹ Females constituted 68.6% of the study sample compared to males (31.4%). These results were somehow consistent with those of a study conducted in Iran which also revealed a higher proportion of females (53.4%) compared to males (46.6%),¹¹ but they were inconsistent with the Korean study which showed a higher proportion of males (51.8%) compared to females (48.2%).⁹ With regard to the site of lesions, the study showed that 64.3% of the patients had a generalized lesion of

atopic dermatitis, followed by trunk (17.1%), face (11.4%), and extremities (7.1%). Compared to the Korean study, head and neck constituted 35% of the studied patients, upper extremities (35%), lower extremities (25%), and trunk (11%).⁹ Our study revealed that the majority (58.3%) of those aging less than two years had face lesions compared to 41.7% who had generalized lesions, and for those aging 2-15 years, 53.3% of them had generalized lesions compared to 26.7% with extremities lesions. While the majority (74.4%) of the patients aging more than 15 years had generalized lesions and 23.31% of them had trunk lesions. These results were consistent with general concept of lesion site according to patient's age which states that the distribution patterns vary according to the patients' age; during the first 2 years of life, the diseased is more commonly involve the face and scalp, while in older children, the lesions are commonly found in the extremities. In adults, it is more generalized, but sometimes localized to areas like the hands.¹² One of the major criteria in the diagnosis of atopic dermatitis is the existence of a family history of the disease, which is considered to be an important risk factor for atopic dermatitis. The study revealed that 54.3% of the patients had a positive family history of atopic dermatitis. Studies from a number of western countries have also found a positive family history of the disease in 53-80% of the studied patients.^{13,14} In a study conducted in Thailand on adults, 54.2% of the patients had a positive family history of the disease.¹⁵ Regarding the history of other atopic diseases among the studied patients, the study showed that 48.5% of them had a positive history of other atopic diseases, 11.8% had asthma, 67.6% allergic rhinitis, and 20.6% had both diseases. Compared to a study conducted in Turkey, 44.2% of patients had a positive history of other atopic diseases like asthma and allergic rhinoconjunctivitis.¹⁶ The study revealed that the patients, in general, had elevated both leptin level (60%) and

IgE level (64.3%). These results were consistent with those of a case-control study conducted in Egypt, which revealed that the serum leptin level was significantly elevated among cases than healthy controls.¹⁷ In contrast, a study conducted by Nagel et al. revealed no significant associations between high leptin levels and the prevalence of the symptoms of atopic dermatitis.¹⁸ On another hand, our study also showed that there is a significant association between high leptin level and high IgE level since 75.6% of the patients who had high leptin level also had a high IgE level. While a study conducted in Egypt revealed that the serum leptin level was inversely correlated with the serum IgE level and that this correlation was statistically significant.¹⁹

Conclusion

Atopic dermatitis affects a wide range of age groups, and different age categories have different sites of the lesion. Family history is a prominent diagnostic criterion of the disease. Almost half of the patients had a history of other atopic diseases like asthma and allergic rhinitis. Clinically, lichenification is more common among older age groups compared to the eczematous lesion, which is more common among younger age groups. Both leptin and IgE levels were high in most of the patients, and in about three quarters of the patients high leptin level was significantly associated with high IgE level. Further studies need to be conducted focusing on the association between obesity and atopic dermatitis and the relation of high leptin level with the severity of the disease.

Competing interests

The authors declare no competing interests.

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